**Class Vll**

**Chemistry**

**Chemical substances and Processes**

**Objectives:**

* **Students will learn the concept of pure substance and Mixture.**
* **Students will understand the symbol and chemical formula of compounds.**
* **Students will learn the concept of Chemical reaction and different terminology related to reaction i.e., Reactant, Product and chemical equation.**
* **Students will understand how to balance a chemical reaction.**
* **Students will understand the types of chemical reaction.**

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| **Topic** | **Description** |
| **Pure substance** | \*Substance made up of same kind of particles.  e.g. Iron (Fe) |
| **Classification of Pure substance** | Types:   * Element * Compound |
| **Element** | \*Substance made up of same kind of atoms.  e.g. Iron (Fe) |
| **Compound** | \*Substance made up of same kind of molecules.  e.g. Water molecule (H2O) |
| * In mixture material consist of two or more pure substance combined in any proportion. * In case of compound, Ratio proportion is always fixed. | |
| **Chemical symbol** | \*Representation of element by the letter of English alphabet.  Elements and Symbol.   * Hydrogen (H) * Sodium (Na) * Magnesium (Mg) * Aluminium (Al) * Calcium (Ca) * Potassium (K) * Iron (Fe) * Copper (Cu) * Gold (Au) * Silver (Ag) * Carbon (C) * Oxygen (O) * Sulphur (S) * Nitrogen (N) * Phosphorus (P) * Chlorine (Cl) * Bromine (Br) * Iodine (I) |
| **Chemical Formula** | \*Formula which contain the type and number of atom of each kind present in the substance. |
| **Ion** | \*Charged species is known as Ion.  Types:   * Cation : Positively charged species.e.g Ca+2 * Anion: Negatively charged species. e.g. O-2   Ion and Symbol   * Sodium (Na+) * Magnesium (Mg+2) * Aluminium (Al+3) * Calcium (Ca+2) * Hydrogen (H+) * Copper (Cu+2) * Iron (Fe+2) * Zinc (Zn+2) * Ammonium (NH4+) * Chloride (Cl-) * Oxide (O-2) * Hydroxide (OH-) * Carbonate (CO3-2) * Sulphate (SO43-) * Nitrate (NO3-) * Acetate (CH3COO-) * Phosphate (PO43-) |
| **Writing Chemical formula** | \*Steps:   1. Symbolic representation of ion and their charge on the top right corner of the symbol. 2. Common factor, if any is removed. 3. Charges of two ions are criss crossed and written at the bottom –right of the symbol of the two ions.  * e.g. Formula of Sodium Oxide     Na+ O2-      Na2 O  Formula of Magnesium Phosphate (PTO)  Mg2+  PO4 3-    Mg3(PO4)2  Formula of Copper Carbonate  Cu2+ CO32-    CuCO3   * Common factor b/w the number corresponding to the two charges. |
| **Chemical Reaction** | \*The process leads to a chemical change from one substance into another. |
| **Physical Change** | \*Change in which no new substance is formed.  e.g.   * Melting of Ice. * Evaporation of water. |
| **Chemical Change** | \*Change in which a new substance is formed with different chemical properties.  e.g.   * Burning of paper. * Rusting of Iron. * Curdling of milk. |
| **Reactant** | \* Substance Undergoes a chemical change in the reaction.  OR  \*Originally taken substance. |
| **Product** | \*The newly formed substance. |
| **Chemical Equation** | \*Representation of a chemical reaction using symbol and formulae of substance involved in the reaction.  Reactant Product |
| **Balanced Chemical reaction** | \*Reaction in which the number of atom of each element are same on both side. |
| **Balancing of chemical reaction** | Steps:   * To Write Word equation. * Write skeletal equation. * Enclose the formula in boxes. * To list the number of atoms of different element on L.H.S. or R.H.S. * To start balancing of different elements. * To check the correctness of the balanced equation.   e.g. H2+Cl2----------------->HCl  Element on L.H.S R.H.S  H 2 1  Cl 2 1  To balance the equation HCl on R.H.S multiply by 2  H2+ Cl2--------------> 2HCl |
| **Types of Chemical Reaction** | Types:   * Combination reaction * Decomposition reaction * Displacement reaction * Neutralisation reaction |
| **Combination reaction** | \*Two or more substance combine together to form a single product.  A+ B ------------> C   * N2 +3H2------------>2NH3 * 2Mg + O2------------->2MgO |
| **Decomposition reaction** | \*Single substance breaks down to give two or more products.  A------------------>B+ C  Decomposition of Calcium carbonate.  CaCO3(S)-------------->CaO(S) + CO2(S) |
| **Displacement reaction** | \*More reactive element displaces less reactive element.  Fe(s) + CuSO4(aq)--------->Cu(S) + FeSO4(aq) |
| **Neutralisation reaction** | \*Acid and base combine together to form salt and water.  Acid + Base------------>Salt + Water  NaOH (aq) + HCl (aq)---------------->NaCl (aq)l + H2O(l) |

**Extra point:**

* Decomposition reaction are opposite of combination reaction.
* Rust (Fe2O3.xH2O) : Hydrated ferric Oxide.

**Activities:**

* To study displacement of Cu from Copper sulphate solution by Iron.
* To study Neutralisation reaction b/w Sodium hydroxide and hydrochloric acid.
* To study the reaction between Magnesium and oxygen to form Magnesium oxide.

**SA-1 (Notes)**

**Class-VII**

**Biology**

**Chapter-1 Nutrition in Living organism-Plants**

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| **S.No.** | **Main points** | **Explanation** |
| 1 | Nutrition | Process of obtaining and utilizing of food is known as nutrition. |
| 2 | Mode of nutrition | **Mode of Nutrition**    Autotrophic Nutrition Heterotrophic Nutrition  (All green plants) (Animals, Man ,Non green plants)  **Saprotrophic Nutrition Parastic nutrition Holozoic Nutrition**  (Dodder)  (Amoeba,Man)  **(Fungi, Mushroom, Bread mould)** |
| 3 | (**AutoTrophs** - Auto-Self, Trophs-Food) | It is mode of nutrition in which organism can make their own food from simple raw material. Example – All green plants. |
| 4 | **Heterotrophs-**  Hetero-other, trophs-food | It is mode of nutrition in which organism cannot prepare their food on their own and depend on others. Example-animals |
| 5 | **Saprotrophic Nutrition** | Saprotrophic nutrition is the process by which the organism feed on dead and decaying matter.  Rhizopus, Mucor, Yeast |
| 6 | Photosynthesis  Photo-light, Synthesis- to combine | Photosynthesis is the process by which green plants prepare their own food.  Sunlight  Carbon dioxide +Water Glucose +  chlorophyll Oxygen |
| 7 | Raw materials for photosynthesis | 1. **Water and Minerals** -These are absorbed by the roots from the soil 2. **Carbon dioxide** - Carbon dioxide enters the leaves through tiny pores called stomata |
|  |  | 1. **Sunlight-** Energy from the sun is called solar energy 2. **Cholorophyll-** Chlorophyll pigment helps leaves to capture solar energy. |
| 8 | Products of Photosynthesis | Carbohydrate-glucose. It is converted to starch. |
| 9. | Symbiotic relationship  (greek word symbion-to live together) | Two organism live in close association and develop a relationship that is beneficial to both this is called symbiotic relationship  Exam. Lichen is a living partnership between a fungus an an alga. Fungus absorbs water and provides shelter and alga prepare food by photosynthesis |
| 10 | Insectivores plant | Pitcher plant- plants feed on insects for their nitrogen requirements. |

**Chapter-2**

**[Nutrition in Living organism-Animals and Man]**

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| 1 | Holozoic nutrition | It means feeding on solid food. Organism takes complex organic food into body , E.g. Man, Amoeba, dog, etc. |
| 2 | Herbivores | Animals which feed on plants only. E.g. deer, cow. |
| 3 | Carnivores | Animals which feed on flesh or meet. E.g. tiger |
| 4 | Omnivores | Animals which feed on both plant and flesh. E.g. Man, dog |
| 5 | Steps of Holozoic nutrition | 1. Ingestion: taking food into mouth. 2. Digestion: break down of large insoluble food into small water soluble molecule by enzymes. 3. Absorption: digested food absorbed through intestinal wall into blood. 4. Assimilation: absorbed food is taken by body cells for releasing energy, growth and repair. 5. Egestion: eliminating undigested food from body. |
| 6 | Phagocytosis | It means cell feeding. It is a process of obtaining food by amoeba. |
| 7 | Pseudopodia | Pseudo- (False) Podia- (Feet) |
| 8 | Holozoic nutrition in amoeba. | Amoeba ingest the food which float in water by help of pseudopodia and digest it food vacuole by enzymes present in it, then absorbed it in body and use it for growth of body , at last undigested food egested from body by contractile vacuole. |
| 9 | Digestive organ of human being | Mouth, oesophagus, stomach, small intestine and large intestine with glands like salivary, liver, pancreas . |
| 10 | Teeth | An organ which breaks down the complex food and help in chewing the food. |
| 11 | Milk –Teeth | The first set of 20 small teeth when baby is 6-7 months old. |
| 12 | Permanent-Teeth | The second set of 32 larger teeth, when child is 6-7 years old. And comes by replacing milk- teeth. |
| 13 | Enamel | A white, Strong, Shining, Protective Material covering on teeth. |
| 14 | Different Types of teeth | 1. Incisors- It is used for cutting food. 2. Canines- It is used for tearing food. 3. Premolar and Molar- It is used for grinding the food |
| 15 | Tongue | A mascular organ attached to the floor of buccal cavity which helps in tasting and mixing the food with saliva for digestion. |
| 16 | Ruminants | These are grass eating animals. Example- Cow, goat, horse etc. |
| 17 | Rumen | The part of ruminant animals, stomach, which has some microbes that helps in partial digestion of cellulose of plant material. |

**Chapter-8**

Topic:- Transportation in plants and animal

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| Main points | Explanation |
| 1.Vascular tissue | A plant tissue which helps in transportation |
| 2. Xylem tissue | It helps in transporting water and mineral in plants. |
| 3.Phloem | It helps in transporting food in plants |
| 4. Translocation | The process of transporting food from leaves to other part of plants |
| 5. Transpiration | A loss of water from stomata in leaves |
| 6. Blood | A red colour fluid with circulates in body of animals. |
| 7. plasma | Fluid part of blood which consist of nutrients , hormones, and waste products. |
| 8. Erythrocytes | RBC which provide red pigment hemoglobin to blood. |
| 9. Leucocytes | It provides protection to body from pathogens. |
| 10. Thrombocytes | Helps in clotting of blood during injuries |
| 11 Blood vessel | Tube like structure present in body for carrying blood in. |
| 12. Artery | It carry oxygenated blood from heart to body parts. |
| 13 veins | It carry deoxygenated blood from body part to heart. |
| 14. Capillary | A thin walled narrow tube which connect artery and vein. |
| 15 Heart | A muscular organ present in thoracic cavity and helps in pumping blood in body. |
| 16. Double circulation | A circulatory system in which blood travel twice through heart in one complete cycle. |
| 17. Heart beat | One complete contraction and relaxation of heart (72 times in a minute) |
| 18. Stethoscope | Instrument which measures heart beat. |
| 19. Systolic pressure | Maximum pressure at which blood flows during contraction of heart.(120mmHg) |
| 20 Diastolic Pressure | Minimum pressure at which blood flows during relaxation of heart.(80mmHg) |
| 21 Sphygmomanometer | Instrument which measures blood pressure |
| 22 lymph | A light yellow liquid flowing from body tissue to blood circulatory system and provides immunity |
| 23 bicuspid valve | It protect back flow of blood from left ventricle to left atrium. |
| 24 Tricuspid valve | It protect back flow of blood from right ventricle to right atrium. |

Topic:- Excretion in plants and animals

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| Main points | Explanation |
| 1.Excretion | Process of removing waste product from body |
| 2. Excretory products of plants | CO2, O2, water vapour , peel of bark , fruits , leaves , gum , raisin etc. |
| 3.Raphides | Plant waste stored in form of solid body |
| 4. Excretory products of human | Carbon dioxide , urea, etc |
| 5. Kidney | Organ which remove toxic substance urea from blood and filter it. |
| 6. Urine | A yellowish liquid which contain water an urea. |
| 7. Dialysis | The procedure used for cleaning blood of person in case of kidney failure. |
| 8. Nephron | Functional unit of excretory system present in kidney for filtering blood. |
| 9. Renal Artery | Blood vessels which bring blood from heart to kidney |
| 10. Renal vein | Blood vessel which bring blood from kidney to heart. |
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**SA-2 (Notes)**

**CLASS VII (BIOLOGY)**

**Chapter: 9**

**Topic:- Reproduction in Plants**

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| Main points | Explanation |
| 1.Reproductin | The process of ability of living organism to produce young ones of same kind is called reproduction. E.g. dog gives birth to puppy |
| 2. Asexual reproduction | It is a process in which young ones are produced by a single parents without formation and fusion of gametes. |
| 3. Binary fission | A method of asexual reproduction in which parent cell divide into two daughter cells. E.g. amoeba , euglena etc. |
| 4. Multiple fission | Asexual reproduction in which the repeated division of a parent cell into a number of small individuals. E.g. Plasmodium. |
| 5. Budding | Asexual reproduction in which the formation of a new individual from a small protuberance (bud) arising on parent body. E.g. hydra, yeast. |
| 6. Fragmentation | It is a method of asexual reproduction in which mother’s body is divided into small fragments which further develop into and new individual. E.g. Spirogyra |
| 7. Spore formation | It is a method of asexual reproduction in which spores are formed on the mother’s body , after becoming mature its splits up into individual which further grow. E.g. rhizopus. Mosses etc. |
| 8. Vegetative propagation | It is a method of asexual reproduction in which new plants are produced from vegetative parts like roots, stem, or leaf of parent plant. Example. From leaf in bryophyllum, from stem in potato and from roots in sweet potato. |
| 9. Sexual reproduction | It involves formation and fusion of gametes or sex cell. |
| 10. Unisexual flower | The flower which may contain either only pistil or only stamen. E.g. papaya |
| 11. Bisexual flower | The flower which contain both pistil and stamen. E.g. China rose, Brinjal, mustard . |
| 12. Pollination | Transfer of pollen grains from anther to stigma in a flower is known as pollination. |
| 13. Self pollination | It is a process in which pollen grains are transfer either from anther to stigma in same flower |
| 14. Cross pollination | The process of transfer of anther to stigma from a flower to different flower of different plant of same kind. |
| 16. Pollinator | These are the agents that carry or transfer the pollen grains from an anther to stigma. E.g. Wind, water , insects , bird etc.. |
| 17 Fertilization | Fusion of male gamete with female gamete is known as a fertilization. |
| 18 Zygote | It is a new cell formed by fusion of male and female gametes. |
| 19. Embryo(plant) | The zygote when divides inside the ovule to form a baby plant called embryo. |

**Chapter: 15/Topics/Forest**

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| Main points | Explanation |
| 1.Forest | It is an area with high density of trees. |
| 2. Components of forest | Forest is composed of two components- a biotic(nonliving like soil water and mineral) and biotic(living like plants and animals) |
| 3. Food chain | The process of eating food in which who eats whom or one organism is eaten by another organism is known as food chain. |
| 4. Food Web | When two or more than two to food chains are interlinked with each other in nature they are called as food web |
| 5. Un destroy layer of forest | It is made up of bushes , shrugs and young trees adapted to living under forest. |
| 6. Forest floor layer | It comprises decomposing leaves, animal droppings. That trees and animals. |
| 7. Canopy | It is formed by mass of branches, twigs and leaves of tall trees. It formed a shady protective(umbrella) over the rest of the forest. |
| 8. Emergent layer | It exist in tropical rain forest and composed of scattered trees. |
| 9. Importance of forest | Forest are very important, social, cultural , historical, economic and industrial development of any country by maintaining ecological balance. |
| 10. deforestation | Cutting of trees is known as deforestation |
| 11. Desertification | The conversion of fertile land of soil into desert |

**Chapter:13/Topics/ weather, climate and adaption of animals to climate.**

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| Main points | Explanation |
| 1.Weather | It is a state of the atmosphere at a particular time and place with respect to elements like humidity, temperature, cloudiness, wind and pressure. |
| 2. Meteorology | The study of science of weather and weather forecasting is known as meteorology. |
| 3. Temperature | It is a measure of degree of hotness and coolness of air on earth. |
| 4. Humidity | It is a measure of amount of water vapour in atmosphere. |
| 5. Precipitation | It is produced when droplets and crystals in clouds grow large enough to fall on ground in form of rain, snow, hail, and ice pellets. |
| 6. Wind | It is the horizontal movement of air which name after the direction from which comes. |
| 7. Climate | It is the average weather in a particular region over a long period of time. |
| 8. Adaption | It is a trait that makes an animal or plant suited to its environment or to cope up in unfavorable condition of atmosphere. |
| 9. Polar region | It is the area of globe surrounding the poles of north and south, these are also called as frigid zones. E.g. Arctic Ocean. Siberian region of Russia, Sweden US. Etc.. |
| 10. Tropical rain forest | It is the region characterized by heavy or high rain fall, which often results in poor soils due to leaching of soluble nutrients. |
| 11. Adaptive feature of polar bear | They have thick and white fur which help them to height in snowy white back ground for catching prey and protect them from predators. |
| 12. Adaptive feature in penguin | Their feathers are densely packed from protection against cold and they have stream lined body and pedal like feet to swim under water. |
| 13. Adaptive feature in monkey | They have long prehensile tails for grasping branches and long arms and legs two swing from one branch to another. |
| 14. Adaptive feature in elephant. | They have versatile trunk which act like a hand for grasping shrubs and food material into mouth. Their nostril at the trunks tip to detect smell. |